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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/290,046 04/12/99 IINO

A S004-3645

EXAMINER

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BRUCE L. ADAMS  
ADAMS & WILKS  
50 BROADWAY  
31ST FLOOR  
NEW YORK NY 10004

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UNITED STATES DEPARTMENT OF COMMERCE  
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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 12

Application Number: 09/290,046

Filing Date: 04/12/99

Appellant(s): Akihiro Iino

AKIHIRO IINO  
For Appellant

**EXAMINER'S ANSWER**

**MAILED**  
**JUL 11 2001**  
**GROUP 2800**

This is in response to appellant's brief on appeal filed 6-19-01.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

Art Unit: 2834

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

This appeal involves claims 1-4, 6-14, 22-32 and 35-51.

Claims 5, 33 and 34 allowed.

Claims 15-21 been canceled.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on 3-29-01 has been entered.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Art Unit: 2834

Appellant's brief includes a statement that claims do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

5,438,229	Ohtsuchi et al	8-95
5,001,404	Kataoka	3-91
5,198,714	Salomon et al	3-93
6,064,138	Iino et al	5-00
5,780,955	Iino et al	7-98
5,763,981	Okazaki et al	6-98
5,406,160	Shirasiki	4-95

**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 22-32 and 48-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kataoka or Saloman in view of Iimo (955) or Iimo (138).

Kataoka and Saloman teach a vibration motor using polarized piezoelectric material for drive and detection electrodes. The drive circuits are not explicitly self-oscillating. Iimo

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(138) and (955) teach it is advantageous to drive piezoelectric vibration motors with self-oscillation circuitry to yield stable operation and use less power. Thus, for at least these reasons it would have been obvious to one of ordinary skill in the art to provide Kataoka or Saloman with self-oscillating drive circuitry.

Claims 6-14 and 33-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okawazaki in view of Shirasaki or Ohtsuchi and combined with Inio (955).

Okazaki teaches the specific piezoelectric vibration motor structure with a drive circuit. However, Okazaki does not use a self-oscillating feed back drive circuit. As noted above Iimo teaches reasons to use a self-oscillation drive circuit. Shirasaki and Ohtsuchi teach using feedback circuitry, including polarized piezoelectric detection electrodes to achieve frequency stability even drive force etc, etc. Thus for each of the known reasons it would have been obvious to one of ordinary skill in the art to provide Ohtsuchi with a self-oscillating drive circuit using polarized piezo feedback elements.

Note that the reference Izukawa previously relied on is hereby withdrawn.

**(11) Response to Argument**

Applicant makes three arguments: (1) the prior art doesn't teach locating feedback electrodes at anti-nodal locations (2) The prior art does not teach providing feedback electrodes symmetrically with regard to anti nodal locations and (3) There is no motivation (other than applicants suggestion) to drive vibration wave motors in a self-oscillating mode.

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Taking the last issue first, the rejection clearly states that a person of ordinary skill in the art would be motivated because of the known, expected benefits e.g. to yield stable operation and use less power. It is curious that applicant indicates there would be no motivation to drive a vibration wave motor in a self-oscillation mode when applicants acknowledged prior art (see specification pg 1-7 and figs. 33 and 34) clearly teaches that self-oscillation drive mode for vibration wave motors is specifically known in the prior art. Thus regardless of whether the examiners proposed motivation to combine Iino with Kataoka or Salamon is arguable, applicants already know use of self-oscillation with a vibration wave motor is prior art.

Regarding applicants first two arguments please note Kataoka col. 3 ln 55-68 which explicitly states in part "A central portion --- of the vibration detecting electrode --- is an anti node of the standing wave ---". Also, please note fig. 7 of Salomon which shows the center of 57 and 56 located  $\frac{1}{2}$  from the center of drive electrodes 5 and 4 respectively. These locations are known anti-nodes. Even with at these explicit teachings it is common knowledge that the maximum output signal from a piezo electric element is generated at an anti-node (maximum amplitude) while no output can be obtained at a node (no movement, no amplitude). Thus it is only logical to realize that if maximum output is desired to locate the pick-up or detection electrode at an anti-node.

The portions of Salomon and Kataoka references above show the detection electrodes to be symmetrical about anti-nodal locations.

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Regarding claims 6-14 and 33-47 it is pointed out that the specific ultrasonic motor structure is shown to be well known by Okawazaki. Given the known benefits of self-oscillation for use with piezoelectric ultrasonic motors as demonstrated by Iino et al it would have been obvious to one of ordinary skill in the art to apply self-oscillation to any known piezoelectric motor construction. Also, as taught by Iino self-oscillation requires feedback. It is well known as shown, e.g. by Shirasaki and Ohtsuchi to extract feedback from piezoelectric motors via the self generation effect and providing suitable detector (feedback) electrodes.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

WALTER J. BUDD  
PRIMARY EXAMINER  
ART UNIT 212

nt  
July 10, 2001

Conferees: M. Gellner

N. Ramirez

N/R

N/R